

proposals to also use the 29.25 - 29.5 GHz band for feeder links to serve NGSO MSS systems. The Commission must resolve this potential for mutual exclusivity through the statutorily-mandated means,^{59/} and, here and elsewhere, Hughes has proposed a number of technical solutions.^{60/}

Until the potential for mutual exclusivity between NGSO MSS and GSO FSS is resolved, the Commission's tentative conclusion that the MSS feeder links would not likely be subject to competitive bidding is premature. This determination was initially based upon the assumption that these "intermediate links" are readily susceptible to frequency coordination and are of little relative value.^{61/} For the reasons described above, these assumptions do not hold in the 29.25 - 29.5 GHz part of the 28 GHz band. There is no reason to think that GSO FSS earth stations and FSS earth stations that are used to provide feeder links to NGSO MSS stations can co-exist on a co-frequency, co-directional basis. The possibility that the feeder link applications of other Big LEO Systems (beyond Motorola and TRW) may need to be considered in the 28 GHz band further complicates an already difficult situation.

Moreover, the Commission clearly has determined that feeder links for NGSO MSS systems are part of the same class of FSS services as the GSO FSS^{62/} and it has

59. See 47 U.S.C. § 309(j).

60. See Section II.B.4 above.

61. See *Competitive Bidding Second Report & Order*, 9 F.C.C. Rcd at 2355-56 n.30.

62. *MSS/FSS 29.5-30.0 Reallocation Order*, 9 F.C.C. Rcd at 3404. It would be arbitrary and capricious to classify feeder links as part of the FSS service in order to allow them to file for a license, but then to determine that they are part of a different

conditionally granted licenses to three MSS systems that seek to use FSS bands for these feeder links.^{63/} As long as mutually exclusive applications are pending for the same class of licenses (in this case, FSS licenses), the Commission cannot treat some applicants differently than others for purposes of competitive bidding. Therefore, if the Commission or the parties cannot resolve the current mutual exclusivity between TRW, Motorola and the pending GSO FSS proposals, there is no basis under the Communications Act to exempt MSS feeder link applicants from the potential for competitive bidding to which FSS GSO applicants may be subject.

D. Proposed Auction Rules

As a general matter, Hughes believes that many of the issues the Commission has raised about satellite spectrum auctions are best addressed after the Commission has a full set of concrete proposals for satellite use of the 28 GHz band. Those applications will provide the basis for addressing certain issues such as the ideal size of spectrum blocks for

"class" of licenses than GSO FSS satellites for purposes of Section 309(j) of the Communications Act. See Administrative Procedure Act, 5 U.S.C. § 706(2)(A) (1988).

Since feeder links are part of the FSS service, the nature of their use of the spectrum (i.e., as an "intermediate link") must be considered for purposes of determining whether the principal use of the FSS portion of the Ka band will be for subscriber services. See Section III.A.2., above.

63. See *In re Application of TRW Inc.*, File Nos. 20-DSS-P-91(12); CSS-91-015; 17-SAT-LA-95; 18-SAT-AMEND-95 (Order and Authorization) (released January 31, 1995); *In re Application of Loral/QualComm Partnership, L.P.*, File Nos. 19-DSS-P-91(48); CSS-91-014; 21-SAT-MISC-95 (Order and Authorization) (released January 31, 1995); *In re Application of Motorola Satellite Communications, Inc.*, File Nos. 9-DSS-P-91(87); CSS-91-010; 43-DSS-AMEND-92; 15-SAT-LA-95; 16-SAT-AMEND-95 (Order and Authorization) (released January 31, 1995).

bidding purposes (e.g., 500 MHz or 1000 MHz). Thus, Hughes recommends that issues about auction procedures be addressed in a further notice of proposed rulemaking *if and when* the Commission determines to auction the 28 GHz band for satellite services.

As a preliminary matter, however, Hughes believes that some of the Commission's current competitive bidding procedures should be modified if satellite auctions are held. In particular, given the vastly different satellite service areas that are possible from a given orbital location and the difficulty of estimating the population that can be served from one orbital location, it would be impractical to base a bidding activity rule on the number of "MHz/pops."^{64/} Rather, bidding activity should be determined by whether an applicant has bid on a sufficient number of spectrum blocks in a given round.

However, as noted above, the appropriate size of those blocks will best be addressed after all 28 GHz applications are submitted. Hughes therefore recommends that these types of procedural auction issues be addressed by another NPRM in this proceeding if competitive bidding is determined to be appropriate for satellite licenses.

IV. CONCLUSION

The Commission's proposed band plan hinges entirely on the terms under which NGSO MSS feeder links and GSO FSS systems (GSO FSS) will share 250 MHz of the same spectrum. GSO FSS systems require access to a full 1000 MHz of the 28 GHz band. However, under the current proposal to allow NGSO MSS feeder links to share 250 MHz of the 28 GHz band on first-come-first-served basis proposal, GSO FSS system could lose access to at least 25% of their spectrum over a very large part of the United States.

64. See Notice at ¶¶ 157-165.

Hughes has proposed two practical solutions to this NGSO MSS feeder link/GSO FSS sharing problem: (i) reverse band working to accommodate feeder links in the companion downlink band to the 28 GHz band (i.e., at 19.45-19.65 GHz), which would relieve much of the current conflict in the 28 GHz band and allow the feeder links needs of at least two NGSO MSS systems to be accommodated; and (ii) a slight revision to the proposed band plan that capitalizes on the ability of LMDS to share the same spectrum as NGSO MSS feeder links, does not increase the amount of spectrum provided to any one service, and allows the GSO FSS service to access a full 1000 MHz of spectrum without unreasonable constraints.

The failure to adopt a feasible method to facilitate GSO FSS and NGSO MSS feeder link sharing, such as reverse band working, could not only prevent GSO FSS networks from accessing 25% of the spectrum proposed to be allocated to them in the current band plan, but also would unduly constrain the development of GSO FSS systems at 28 GHz. Absent the adoption of the reverse band working principles outlined above, Hughes urges the Commission to modify its band plan to obviate the need for GSO FSS and NGSO MSS feeder link sharing.

Respectfully submitted,

Hughes Communications, Inc.

By: 

John P. Janka

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William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, NW
Washington, DC 20554

Re: CC Docket No. 92-297, RM-7872, RM-7722
Ex Parte Presentation

Dear Mr. Caton:

On behalf of Hughes Communications Galaxy, Inc., the enclosed letter and attached materials were delivered today to Lisa B. Smith, Legal Advisor to Commissioner Barrett.

An original and two copies of this letter are enclosed. A copy of this letter is being provided simultaneously to Ms. Smith.

Respectfully submitted,

John P. Janka

Enclosures

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July 3, 1995

Lisa B. Smith
Legal Advisor
Office of Commissioner Andrew C. Barrett
Room 826, Stop Code 0103
Federal Communications Commission
1919 M Street, NW
Washington, DC 20554

Re: CC Docket No. 92-297, RM-7872, RM-7722
Ex Parte Presentation

Dear Ms. Smith:

At your request, enclosed on behalf of Hughes Communications Galaxy, Inc. is a brief paper prepared by Stanford Telecom that confirms that allocating two separate, non-contiguous bands of 28 GHz spectrum for LMDS would not increase the cost of implementing an LMDS system and actually would be a benefit for some LMDS configurations.

Also enclosed are two charts that summarize the band segmentation plans and related issues that we discussed last Thursday.

Please let me know if you have any questions.

Sincerely yours,

John P. Janka

Enclosures

Assessment of LMDS RF Equipment Start up Costs due to

a Non-contiguous Spectrum Allocation

Stanford Telecom

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The following analysis was prepared at the request of Latham & Watkins, counsel to Hughes Communications Galaxy, Inc. This assessment has determined that the Local Multipoint Distribution Service (LMDS) RF equipment start-up cost is not affected by a non-contiguous Ka band (27.5 to 30.0 GHz) spectrum allotment.

Stanford Telecom has become intimately familiar with the LMDS system as reflected in the January 30, 1995¹ and the March 1, 1995² Hughes Communications Galaxy FCC filings. In this second filing, the RF equipment costs were surveyed; and the High Power Amplifier (HPA) was determined to be the most expensive RF system component (approximately 10 times the cost of any other RF component). Furthermore, the HPA cost was estimated to be approximately 25% of the RF cell site start up cost (includes labor, warranty and dual redundant equipment).³

¹ See "Review of the Propagation Characteristics in the 28 and 40 GHz Frequency Bands for LMDS Applications," prepared by Stanford Telecom, in Comments of Hughes Communications Galaxy, Inc. to ET Docket No. 94-124, RM-8308, dated January 30, 1995.

² See "Assessment of Relative Performance and Costs between LMDS in the 28 and 40 GHz Bands: LMDS is viable in the 40 GHz Frequency Band," prepared by Stanford Telecom, in Reply comments of Hughes Communications Galaxy, Inc. to ET Docket No. 94-124 RM-8308, dated March 1, 1995.

³ Pages 19 through 24 of footnote 2.

Wireless cable HPAs have been designed as broad band devices which operate from 27.5 to 30.0 GHz; in fact, Thomson and Varian both have a wide band Ka band (27.5 to 30.0 GHz) HPA which transmits over 100W for wireless cable applications. Since this RF component is a broad band device (2.5 GHz), a non-contiguous spectrum allotment within this 2.5 GHz band would not require additional HPAs or HPA modification for non-contiguous LMDS service within the 27.5 to 30.0 GHz spectrum.

In the European Multichannel Multipoint Distribution Service (MMDS), cell sites have two possible RF configurations. For a tower site, two HPAs are implemented for cell site transmission. For a roof-top site, single channel solid state power amplifiers are implemented for cell site transmission.⁴ For a single channel power amplifier LMDS configuration, non-contiguous spectrum allotment would have absolutely no cost increase since each channel has its own power amplifier within the Ka band for either a contiguous or non-contiguous spectrum allotment.

Since the HPA is by far the most expensive piece of RF equipment and since its cost is not impacted by a non-contiguous spectrum allotment, a cost impact to other RF equipment, such as the receiver subscriber unit, would be minimal if any at all. LMDS RF equipment was developed for broad band

⁴ Page 5 of footnote 2.

applications, not narrow band applications. The LMDS RF equipment must already operate over a 1 GHz bandwidth. Increasing the bandwidth for the low cost RF equipment to 1.5 GHz would cause slight if any cost increase. Endgate Technology corporation was consulted for other RF equipment costs since Endgate is developing receiver subscriber units and RF cell site equipment. Moreover, Endgate has participated in the FCC filing procedures.⁵ According to Executive Vice President Doug Lockie (and author of Endgate FCC filing), "Non-contiguous spectrum allotment has no substantial cost impact to either the subscriber unit or the cell site hub. Furthermore, two way communication becomes easier with non contiguous spectrum allocation." Two equal spaced non-contiguous spectrum bands, such as the suggested spectrum allotment from the combined Boeing, Hughes, Teledesic, and Texas Instruments FCC filing⁶, is a benefit to a full duplex LMDS system. One band is for transmit while the other band is for receive. The separation between the two bands improves isolation which makes signal filtering easier and cheaper.

In summary, a non-contiguous spectrum allocation causes no cost increase to the LMDS system, and is a benefit for some LMDS system configurations.

⁵ Comments of Endgate Technology Corporation, to ET Docket No. 94-124, RM 8303, dated January 30, 1995, presented by Arant Fox.

⁶ See Further Comments of The Boeing Company, Hughes Communications, Inc., Teledesic Corporation, and Texas Instruments, Inc. CC Docket No. 92-297, dated May 12, 1995.

(1)

**Original FCC Staff Proposal
(Including "Natural" Paired Downlinks)**

UPLINK	SERVICES	DOWNLINK
27.5		17.7
	LOCAL MULTIPOINT DISTRIBUTION SERVICE Fixed-Satellite Service (non-GSO and GSO)	
28.35 or 28.45		18.55 or 18.65
	FIXED-SATELLITE SERVICE (non-GSO) Fixed-Satellite Service (GSO) LMDS grandfathered at 28.35-28.5 for 5 years before non-GSO system likely to operate	
28.85		19.05
	FIXED-SATELLITE SERVICE (GSO) Fixed-Satellite Service (non-GSO)	
29.1		19.3
	FIXED-SATELLITE SERVICE (non-GSO MSS Feeder Links) LOCAL MULTIPOINT DISTRIBUTION SERVICE	
29.25		19.45
	FIXED-SATELLITE SERVICE (GSO) FIXED-SATELLITE SERVICE (non-GSO MSS Feeder Links)	
29.5		19.7
	FIXED-SATELLITE SERVICE (GSO) Fixed-Satellite Service (non-GSO)	
30.0		20.2

Uppercase = Primary
Lowercase = Secondary

PRIMARY HUGHES ISSUE:

No feasible solution for GSO/non-GSO sharing at 29.25-
29.5/19.45-19.7 other than "reverse band working" by non-GSO systems
in the downlink band

(2)

**Revised FCC Staff Proposal
(Including "Natural" Paired Downlinks)**

UPLINK	SERVICES	DOWNLINK
27.5	LOCAL MULTIPOINT DISTRIBUTION SERVICE Fixed-Satellite Service (non-GSO and GSO)	17.7
28.35	FIXED-SATELLITE SERVICE (GSO) Fixed-Satellite Service (non-GSO)	18.55
28.6	FIXED-SATELLITE SERVICE (non-GSO) Fixed-Satellite Service (GSO)	18.8
29.1	FIXED-SATELLITE SERVICE (non-GSO MSS Feeder Links) LOCAL MULTIPOINT DISTRIBUTION SERVICE	19.3
29.25	FIXED-SATELLITE SERVICE (GSO) FIXED-SATELLITE SERVICE (non-GSO MSS Feeder Links)	19.45
29.5	FIXED-SATELLITE SERVICE (GSO) Fixed-Satellite Service (non-GSO)	19.7
30.0		20.2

Uppercase = Primary
Lowercase = Secondary

PRIMARY HUGHES ISSUES:

- (1) No feasible solution for GSO/non-GSO sharing at 29.25-29.5/19.45-19.7 other than "reverse band working" by non-GSO systems in the downlink band
- (2) Grandfathering LMDS at 28.35--28.5 GHz during period when GSO systems likely to be in operation in that band (1998-on)
- (3) Restrictive power limits at 18.6--18.8 GHz